

We claim:

1. A hydrogel contact lens, wherein its basic material contains copolymerized monomers, modified with amino acids, and copolymerized monomers, modified with betaine.

5

2. The hydrogel contact lens of claim 1, wherein the amino acid is selected from amino acids occurring in the natural collagen of the cornea, especially from glycine, proline, glutamine, alanine, arganine, asparagine, lysine, 10 leucine, serine, isoleucine, glycine being preferred.

15

3. The hydrogel contact lens of claim 1 or 2, wherein the monomer, modified with amino acid, is a methacryloyl amino acid.

20

4. The hydrogel contact lens of one of the preceding claims, wherein the monomer, modified with amino acid, is copolymerized with a main chain and/or a side chain of the basic material of the contact lens.

25

5. The hydrogel contact lens of one of the preceding claims, wherein the percentage of amino acid in the polymer is 0.5% to 25% by weight, preferably 0.5% to 10% by weight and particularly about 3% by weight.

30

6. The hydrogel contact lens of one of the preceding claims, wherein the betaine is a sulfobetaine, preferably N-(3-sulfopropyl)-N-methacrylhydroxyethyl-N,N-dimethyl-ammonium betaine (SPE) and/or a carboxybetaine, which forms a block-free copolymer with the basic material.

7. The hydrogel contact lens of claim 6, wherein the percentage of betaine in the polymer is 0.5% to 22% by weight, preferably 0.5% to 10% by weight and particularly about 3% by weight.

8. The hydrogel contact lens of one of the preceding claims, wherein the basic material of the contact lens contains hydroxyethyl methacrylate (HEMA) and/or hydroxypropyl methacrylate (HPMA) and/or vinylpyrrolidone (VP) and/or acrylamide derivatives, preferably dimethylacrylamide.

5

9. The hydrogel contact lens of claim 8, wherein the basic material constitutes 53% to 99% by weight, preferably 80% to 99% by weight and particularly 94% by weight of the polymer.

10

10. The hydrogel contact lens of one of the preceding claims, wherein the refractive index of the contact lens is 1.22 to 1.51.

11. The hydrogel contact lens of one of the preceding claims, wherein the contact lens, in the swollen state, contains more than 50% by weight of water and, in particular, 55% to 60% of water.

12. The hydrogel contact lens of one of the preceding claims, wherein the oxygen permeability has Dk value of  $> 8 \times 10^{-11}$ , preferably of  $> 15 \times 10^{-11}$  and especially of about  $23 \times 10^{-11}$ .

13. A method for the preparation of a polymer material for a hydrogel contact lens, especially one of the preceding claims, characterized by the following steps:

- mixing methacrylate monomers, monomers based on amino acids and monomers based on betaine and
- polymerizing these materials with a starter and a cross-linking agent.

14. The method of claim 13, wherein a free radical starter, preferably azo compounds and/or peroxy compounds and/or photochemical reaction starters are used as starter.

TOP SECRET

15

20

25

30

15. The method of claims 13 or 14, wherein the cross-linking agent is added in an amount of 0.01% to 3% by weight, preferably of 0.5% to 2% by weight and specially of 0.1% to 0.5% by weight.

5 16. The method of one of the claims 13 to 15, wherein the contact lens is polymerized individually as a cast lens with a polymerization time of less than one hour.

10 17. The method of claim 16, wherein the reaction starter is added in an amount of 0.2% to 0.5% by weight.

15 18. The method of one of the claims 13 to 15, wherein the mixture of material initially is polymerized into a block-shaped, preferably rod-shaped material for approximately 1 to 3 days at a controlled temperature and the individual contact lenses are then machined out of the block material.

19. The method of claim 18, wherein the reaction starter is added in an amount of 0.05% to 0.2% by weight.

20 20. The method of one of the claims 13 to 19, wherein up to 20% of glycerin are added for the polymerization.

25 21. The method of claim 20, wherein, when glycerin is used, the percentage of monomers, based on amino acids, is 0.5% to 25% by weight, the percentage of monomers, based on betaine, is 0.5% to 22% by weight and the percentage of methacrylate monomers is 99% to 53% by weight.

RECEIVED  
PATENT OFFICE  
JULY 1974

*Add A1*